Amphibians as environmental omen disputed

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Amphibians, for years considered a leading indicator of environmental degradation, are not uniquely susceptible to pollution, according to a meta-analysis to be published in *Ecology Letters*.

After a review of over 28,000 toxicological tests, researchers from the University of South Dakota, Yale University and Washington State University are challenging the prevailing view that amphibians, with their permeable skin and aquatic environment, are particularly sensitive to environmental threats and, as such, are "canaries," or predictors of environmental decline.

"The very simple message is that for most of the classes of chemical compounds we looked at, frogs range from being moderately susceptible to being bullet-proof," said David Skelly, professor of ecology at the Yale School of Forestry & Environmental Studies and a member of the research team. "There are lots of other kinds of environmental threats that have led to their decline, including habitat conversion, harvesting for food and the global spread of the Chytrid fungus, which is mowing down these species in its path."

The team, led by Jacob Kerby, an assistant professor at the University of South Dakota, based its analysis on information gleaned from the Environmental Protection Agency's (EPA) Aquatic Toxicity Information Retrieval database, examining 1,279 species, among them segmented worms, fish, bivalves such as clams, insects and snails. Those species were exposed in water to various concentrations of 107 chemical agents, including inorganic chemicals, pesticides, heavy metals and phenols, a

class of chemical compound.

"What our results suggest is that all animals are susceptible to chemical stressors and that amphibians are potentially good indicators," said Kerby. "There isn't any evidence that they're a uniquely leading indicator. We tried to be comprehensive in the types of chemicals and organisms that we examined."

In light of the findings, Skelly said, scientists should evaluate the absence, presence or abundance of amphibians in wild populations as "signals" of potential exposure to different chemicals in the environment. "If we have such an understanding for several species, we may be able to use their responses, collectively, as a means of narrowing potential causes of environmental degradation," he said.

The EPA, according to the paper, uses African Clawed Frogs as a proxy for biological diversity when determining a species' sensitivity to chemical exposures, even though that particular species does not occur naturally in North America. "Our knowledge of amphibians' sensitivity to particular chemicals or classes of chemicals has not been used to design assays for effects in nature," Skelly said.

The paper is titled "An examination of amphibian sensitivity to environmental contaminants: are amphibians poor canaries?"

Source: Yale University (news : web)